REMARKS/ARGUMENTS

Status of Claims

Claims 1 to 15 remain in the application. Claims 16 to 30 are cancelled.

35 U.S.C. § 103 Claim Rejections

In paragraph 4 of the Office Action, the Examiner rejects claims 1, 6, 8, 9 and 14 under 35 U.S.C. § 103(a) as being unpatentable over Avidor et al. (U.S. Patent No. 6,654,612) in view of Shakhgildian et al. (U.S. Patent No. 6,584,325) and further in view of Lyer et al. (U.S. Patent No. 6,295,450). Applicant respectfully traverses the rejection for reasons stated below.

The law on obviousness under 35 U.S.C. § 103 was addressed by the United States Supreme Court in *KSR Int'l v. Teleflex, Inc.*, 127 S.Ct. 1727, 1741 (2007). Following this, examination guidelines were released on October 10, 2007 in regards to determining obviousness under 35 U.S.C. § 103. According to these guidelines, the framework for the objective analysis for determining obviousness under 35 U.S.C. § 103 is stated in *Graham v. John Deere Co. 383 U.S. 1,148 USPQ 459 (1966)*. Obviousness is a question of law based on underlying factual inquiries. The factual inquiries enunciated by the Court are as follows:

(1) determining the scope and content of the prior art;

(2) ascertaining the differences between the claimed invention and the prior art; and

(3) resolving the level of ordinary skill in the pertinent art.

The Graham factors, including secondary considerations when present, are the controlling inquiries in any obviousness analysis. Once the findings of fact are articulated, Office personnel must provide an explanation to support an obviousness rejection under 35 U.S.C. § 103. According to the Supreme Court ruling in *KSR*, for the Patent Office to properly combine references in support of an obviousness rejection, the Patent Office must identify a reason why a

person of ordinary skill in the art would have sought to combine the respective teachings of the applied references.

In rejecting claims under 35 U.S.C. § 103, the Examiner bears the initial burden of establishing a prima facie case of obviousness. *In re Oetiker*, 977 F.2d 1443, 1445 (Fed. Cir. 1992). See also *In re Piasecki*, 745 F.2d 1468, 1472 (Fed. Cir. 1984). It is incumbent upon the Examiner to establish a factual basis to support the legal conclusion of obviousness. *See In re Fine*, 837 F.2d, 1071, 1073 (Fed. Cir. 1988). In so doing, the examiner is expected to make the factual determinations set forth in *Graham v. John Deere Co.*, 383 U.S. 1, 17 (1966), *viz.*, (1) the scope and content of the prior art; (2) the differences between the prior art and the claims at issue; and (3) the level of ordinary skill in the art. Additionally, in making a rejection under 35 U.S.C. § 103 on the basis of obviousness, the Examiner must provide some articulated reasoning with some rational underpinning to support the legal conclusion of obviousness. *KSR Int'l. Co. v. Teleflex Inc.*,127 S.Ct. 1727, 1741 (2007). Only if this initial burden is met does the burden of coming forward with evidence or argument shift to the appellant. See *Oetiker*, 977 F.2d at 1445. See also *Piasecki*, 745 F.2d at 1472. Obviousness is then determined on the basis of the evidence as a whole and the relative persuasiveness of the arguments. See *Oetiker*, 977 F.2d at 1445; *Piasecki*, 745 F.2d at 1472.

Applicant's analysis below demonstrates that the Examiner's rejections under 35 U.S.C. 103(a) should be withdrawn, as an analysis following the factual inquiries laid out in *Graham v. John Deere Co.* clearly reveals errors in the Examiner's rejections raised under 35 U.S.C. 103(a).

Claim 1

Applicant submits that claim 1 of the present application is patentable over Avidor et al., Shakhgildian et al. and Lyer et al., as the findings of fact as articulated by the Examiner are inaccurate. In particular, the Examiner has not properly determined (i) the scope of the prior art nor (ii) the differences between the claimed invention and the prior art. Furthermore, the Examiner has not provided a valid explanation to support an obviousness rejection under 35 U.S.C. 103(a). Applicant's reasoning is detailed below.

3

Determining The Scope Of The Prior Art

Avidor et al.

Avidor et al. describes a method whereby <u>base station channel assignment</u> is performed by developing for each cell, or a sector thereof, a priority list <u>of groups of channels</u>, and selecting <u>a channel</u> to be assigned in response to a request for service from the <u>highest priority group of channels</u> which has available channels at the time of the service request. <u>The priority lists are developed based on various interference measurements that are made</u>. (See the Abstract of Avidor et al.) In the teachings of Avidor et al., each base station maintains a priority list of channel groups for uplink communications and a priority list of channel groups for downlink communications. The priority of the <u>channel groups</u> in each list is based on calculations of the interference that is likely to be encountered by a mobile terminal operating within the cell, or sector thereof, served by the base station based on the <u>channel assignments</u> of the base station and its surrounding base stations.

Column 9, line 28 to Column 10, line 61 of Avidor et al. describes the calculations performed in determining the respective priorities of <u>channel groups</u> in the uplink and downlink <u>channel priority lists</u>. It is important to understand that the priority lists described in Avidor et al. are generated and maintained at the base station and are utilized by the base station to select channels for uplink and downlink communication that minimizes the interference of uplink and downlink communications. "For the uplink, the base station assigns a priority <u>to each channel group</u> so that as <u>each channel group</u> has an increasingly smaller value of Uij(g) that <u>channel group</u> receives an increasingly higher priority assignment in the uplink priority list" (Column 10, lines 29-33 of Avidor et al.; emphasis added). "Similarly, for the downlink the base station assigns a priority to each <u>channel group</u> so that as each <u>channel group</u> has an increasingly smaller value of Dij(g) that <u>channel group</u> receive san increasingly higher priority assignment in the downlink priority list" (Column 10, lines 46-50 of Avidor et al.; emphasis added).

In view of the foregoing, it should be absolutely clear that Avidor et al. is directed to channel assignment selection at a base station. That is, Avidor et al. describes a method for selecting a channel for uplink service at a base station based on an uplink priority list of channel

groups that is prioritized in a manner that is intended to minimize uplink signal interference. Avidor et al. also describes a method for selecting a channel for downlink service at a base station based on a downlink priority list of channel groups that is prioritized in a manner that is intended to minimize downlink signal interference.

Shakhgildian et al.

Shakhgildian et al. describes a cellular communication system in which a wireless terminal is configured to receive uplink characteristics information transmitted from a target set of base stations. The wireless terminal selects at least one serving base station from the target set of base stations (cell selection) based on said uplink characteristics information. In some cases, the wireless terminal is configured to calculate an access message transmit power level (uplink characteristics information) and the base station having the lowest calculated access message transmit power level is selected. (See the Abstract of Shakhgildian et al.)

In one example, cell selection is performed differently when a call is being set up than when a short data message is sent. In UMTS, a short data message can be sent in *a single RACH burst*. According to this embodiment, if a short data message is to be transmitted, the serving base station will be selected as the cell having the best uplink performance. However, if instead a call is being setup, the serving base station will be selected as the base station having the best combined performance. (See Column 6, lines 6-16 of Shakhgildian et al.). It is important to note that in neither of these circumstances, is the predominant direction of traffic with respect to the terminal considered in the selection of a base station, rather the base station is selected on the basis of the type of communication that is to be established after the new base station is selected and the message is sent/call is established. That is, the base station selection is not based on a currently predominant direction of traffic with respect to the terminal, instead it is based on prioritizing uplink communication for a new message that is to be sent once a base station is selected or a combined priority for uplink and downlink communication for a new call that is to be set up once the base station is selected.

In view of the foregoing, it is clear that in the teachings of Shakhgildian et al. the target set of base stations for cell selection is maintained in a single priority list and for the purposes of

5

transmitting a new access message, where uplink performance is considered to be paramount, a target base station is selected from the single priority list based on uplink performance information associated with each target base station, and for the purposes of setting up a new voice call, where uplink performance and downlink performance are considered equally important, a target base station is selected from the single priority list based on a combined performance priority. No consideration is given to whether the predominant direction of traffic with respect to a terminal is in the uplink or downlink direction.

Lyer et al.

Lyer et al. describes a method for transferring communication within a communication system. During communication with a serving base station, a handover candidate list is provided to a wireless terminal. The handover candidate list comprises a set of neighboring base stations that are capable of supporting the service requirements of the wireless terminal and does not include any neighboring base station that is incapable of supporting the current service requirements of the wireless terminal. That is, for a wireless terminal with a set of currently active services, e.g. voice call, streaming video/audio, etc., that are currently being supported by a currently serving base station, the currently serving base station provides a handover candidate list of neighboring base stations to the wireless terminal that only includes neighboring base stations that are capable of supporting the currently active services of the mobile terminal. (See the Abstract of Lyer et al.)

It is important to note that the handover candidate list of neighboring base stations generated by the serving base station in the teachings of Lyer et al. is not based on a predominant direction of traffic with respect to the wireless terminal. Rather, the list is based on which of the neighboring base stations are capable of supporting all of the currently active services of the wireless terminal.

Also it is noted that Lyer et al. describes base station selection on the basis of selection from a single handover candidate list of base stations, not from separate uplink candidate and downlink candidate lists based on a predominant direction of traffic with respect to the wireless terminal.

The errors in the Examiner's assessment of the scope of the teachings of the cited references will become apparent with reference to Applicant's following discussion regarding the differences between the cited references and the rejected claims.

Ascertaining The Differences Between The Prior Art And The Claims At Issue

With reference to independent claim 1, independent claim 1 recites:

1.   A method of selecting at least one base station for communicating with a terminal in a wireless communication system, comprising the steps of:

storing an uplink candidate set listing at least one candidate uplink base station;

storing a downlink candidate set listing at least one candidate downlink base station;

determining a predominant direction of traffic with respect to the terminal;

if the predominant direction of traffic is in an uplink direction, selecting at least one optimum base station from the uplink candidate set; and

if the predominant direction of traffic is in a downlink direction, selecting at least one optimum base station from the downlink candidate set.

Avidor et al.

On page 3 of the Office Action, the Examiner asserts that Avidor et al. teaches "storing an uplink candidate set listing at least one candidate uplink <u>base station</u>" (emphasis added) and "storing a downlink candidate set listing at least one candidate downlink <u>base station</u>" (emphasis added). In support of this assertion, the Examiner points to Column 10, lines 27-33 of Avidor et al. However, this assertion by the Examiner is clearly erroneous, as Avidor et al. is completely silent with respect to uplink and downlink candidate sets of <u>base stations</u> for the purposes of base station selection; rather, Avidor et al. merely teaches that a base station maintains separate priority lists for assigning its available channels as either uplink or downlink channels.

Applicant respectfully submits that <u>channel selection</u> in a base station, as described in Avidor et al. is completely non-analogous to a method of selecting at least one base station for communicating with a terminal in a wireless communication system, as recited in independent claim 1. Nor is the channel selection algorithm described in Avidor et al. even described in Avidor et al. as playing any part in base station selection. Rather, it is clear from, for example, Figure 4 and Column 11, line 2 to Column 12, line 20 of Avidor et al., that the uplink and downlink channel group priority lists are used to <u>assign channels</u> in a base station for communication with a wireless terminal that has already selected a base station for communication. See, for example, the fact that the flowchart of Figure 4 begins at step 401 "when a call request is received at a base station for communication with a terminal in section i of that base station."

Moreover, the <u>uplink channel group priority list</u> and the <u>downlink channel group priority list</u> described in Avidor et al. can in no way be equated with the "uplink candidate set listing at least one candidate uplink <u>base station</u>" and the "downlink candidate set listing at least one candidate downlink <u>base station</u>". Accordingly, Applicant respectfully submits that Avidor et al. clearly fails to teach or even suggest "[a] method of <u>selecting at least one base station for communicating with a terminal</u> in a wireless communication system", comprising *inter alia* the steps of: "storing an uplink candidate set listing at least one candidate uplink base station;" and "storing a downlink candidate set listing at least one candidate downlink base station", as recited in independent claim 1.

In view of the foregoing, Applicant respectfully submits that the Examiner has failed to correctly ascertain differences between independent claim 1 and Avidor et al.

Shakhgildian et al.

Shakhgildian et al.simply teaches that "uplink characteristics information" may be considered when selecting a serving base station from a single common target set.

Accordingly, it should be clear that while Shakhgildian et al. may teach that base station selection is based on a consideration of <u>uplink performance</u> or <u>both uplink and downlink performance</u>, the selection is still made from <u>a single candidate base station target set</u>. As such,

there is no valid basis on which the Examiner can conclude that the target set taught by
Shakhgildian et al. represents "an uplink candidate set".

On page 3 of the Office Action, the Examiner concedes that "Avidor et al. does not
explicitly teach determining a predominant direction of traffic with respect to the terminal and if
the predominant direction of traffic is in an uplink direction, selecting at least one optimum base
station from the uplink candidate set". The Examiner relies on Shakhgildian et al. for allegedly
teaching this feature. However, as noted above, Shakhgildian et al. is strictly directed to
maintaining a single candidate base station target set from which a serving base station is
selected. See also, column 6, lines 58 to 61 of Shakhgildian et al., which explicitly states that its
intended purpose is to provide "a better balance between downlink and uplink quality criteria in
cell selection".

The Examiner points to column 6, lines 6 to 16 of Shakhgildian et al. as having taught
"determining a predominant direction of traffic with respect to the terminal ... [and] if the
predominant direction of traffic is in an uplink direction, selecting at least on optimum base
station from the uplink candidate set". However, column 6, lines 6 to 16 of Shakhgildian et al. ,
and Shakhgildian et al. as a whole, merely teaches that "if no cell [in the target set] has both the
best uplink and downlink performance indicator then if a short data message is to be transmitted,
the serving base station will be selected as the cell having the best uplink performance.
However, if instead a call is being setup, the serving base station will be selected as the base
station having the best combined performance" (emphasis added). As such, it should be clear
that Shakhgildian et al. merely teaches that if a short data message, i.e., a message requiring more
uplink data than downlink data, is to be transmitted to the network, a base station from the single
target set is selected only on the basis of uplink performance, whereas a base station is selected
from the single target set based on combined uplink and downlink performance for full duplex
calls.

In view of the foregoing, it should be appreciated that selecting a base station from a
single target set on the basis of uplink performance for a short data message transmission, as
taught by Shakhgildian et al., cannot be equated with "determining a predominant direction of
traffic with respect to the terminal...[and] if the predominant direction of traffic is in the uplink

direction, selecting at least one optimum base station from the uplink candidate set", as simply selecting from a common target set of base stations on the basis of different selection criteria for different types of messages, i.e., selecting based on the uplink performance indicator only for short data messages and based on a combined performance indicator for full duplex calls, is not the same as selecting from different candidate sets depending on the predominant direction of traffic with respect to the terminal".

Accordingly, Shakhgildian et al. fails to overcome the deficiencies in Avidor et al. identified above by the Applicant. That is, no combination of Avidor et al. and Shakhgildian et al. provides a method of selecting at least one base station for communicating with a terminal that includes "storing an uplink candidate set listing at least one candidate uplink base station;" and "storing a downlink candidate set listing at least one candidate downlink base station", as recited in independent claim 1. The priority lists disclosed in Avidor et al. are merely uplink and downlink channel group priority lists that are used at the base station for channel assignment, and thus are totally non-analogous to the uplink and downlink candidate sets of base stations of the claimed invention. Moreover, Shakhgildian in fact teaches away from maintaining separate uplink and downlink candidate lists listing at least one uplink and downlink candidate base station respectively.

Lyer et al.

On page 4 of the Office Action, the Examiner acknowledges that "the combination of Avidor and Shakhgildian does not explicitly teach that if the predominant direction of traffic is in a downlink direction, selecting at least one optimum base station from the downlink candidate set". In support of the rejection of independent claim 1, the Examiner asserts that "Lyer broadly teaches the selection of base stations for supporting specific requirements of a remote unit which includes the requirements for the communication network to provide support for a certain call type (e.g. voice, video, and data)". The Examiner goes on to assert that "A skilled artisan would recognize that the [sic] in order for the network to properly provide support for a call type such as video or data, the base station with the best downlink quality would have to be selected since these call types require data transfer in the downlink direction".

The Examiner provides absolutely no support for this broad and conclusory statement. Furthermore, the Examiner fails to even address the fact that none of the cited references teaches "determining a predominant direction of traffic with respect to the terminal". The Examiner appears to be equating the steps of independent claim 1 that read: "determining a predominant direction of traffic with respect to the terminal" and "if the predominant direction of traffic is in a downlink direction, selecting at least one optimum base station from the downlink candidate set", with the generation of a candidate handover list based on the ability of neighboring base stations to handle all of the current service requirements of a wireless terminal. However, as noted above, no combination of Avidor et al. and Shakhgildian et al., teaches storing an uplink candidate set and a downlink candidate set of base stations, as recited in claim 1, and therefore no modification of Avidor et al. and Shakhgildian et al. based on Lyer et al, which, like Shakhgildian et al., merely describes a single candidate base station list, can be found to support a rejection of the claims under 35 U.S.C. § 103(a). Moreover, the mere teaching in Lyer et al. of a handover candidate set of neighboring base stations that are capable of supporting all of the current service requirements of a terminal cannot be equated with determining a predominant direction of traffic with respect to a terminal and selecting between uplink and downlink candidate sets based on the predominant direction of traffic.

In view of the foregoing, Applicant submits that the Examiner has not properly determined the differences between the claimed invention and the prior art. Therefore, the findings of fact as articulated by the Examiner are improper.

Explanation To Support An Obviousness Rejection

As noted above, for the Patent Office to properly combine references in support of an obviousness rejection, the Patent Office must identify a reason why a person of ordinary skill in the art would have sought to combine the respective teachings of the applied references. The examination guidelines indicate that "The key to supporting any rejection under 35 U.S.C. § 103 is the clear articulation of the reason(s) why the claimed invention would have been obvious." The Court quoting *In re Kahn*, 441 F.3d 977, 988, 78 USPQ2d 1329, 1336 (Fed. Cir. 2006), stated that " '[R]ejections on obviousness cannot be sustained by mere conclusory statements; instead, there must be some articulated reasoning with some rational underpinning to support the

legal conclusion of obviousness.'" Applicant appreciates that the Examiner has articulated a reason why the claimed invention would have been obvious. However, for reasons detailed below, the Examiner's articulated reason can not be regarded as being valid.

As noted earlier, the Examiner has erred in equating the generation of uplink and downlink channel group priority lists described in Avidor et al. with "storing an uplink candidate set listing at least one candidate uplink base station" and "storing a downlink candidate set listing at least one candidate downlink base station", as recited in independent claim 1. Furthermore, neither Shakhgildian et al. nor Lyer et al. overcomes this deficiency of Avidor et al. Accordingly, no combination of Avidor et al., Shakhgildian et al. and Lyer et al. teaches or even suggests storing separate uplink and downlink candidate lists for base station selection. As such, the Examiner's suggested reasons for combining the references are clearly erroneous, as modifying the teachings of Avidor et al., in so far as they pertain to channel assignment at a base station, with the teachings of Shakhgildian et al. and Lyer et al., in so far as they pertain to base station selection from a single target set of base stations, would in no way allow one skilled in the art to arrive at the claimed invention.

As such, Applicant respectfully submits that one skilled in the art would see no reason to modify the channel group prioritization/channel assignment method described in Avidor et al. based on the base station selection methods described in Shakhgildian et al. and Lyer et al. Moreover, modifying Avidor et al. based on Shakhgildian et al. and Lyer et al. would not allow one skilled in the art to arrive at the present invention, as the references, both alone and in combination, fail teach or even suggest all of the features of the claimed invention. That is, the references fail to teach storing separate uplink and downlink candidate sets, and selecting at least one optimum base station from one of the candidate sets based on the predominant direction of traffic with respect to a terminal.

Accordingly, the Examiner's reason to combine Avidor et al., Shakhgildian et al. and Lyer et al. fail to satisfy the requirements set out in the Supreme Court's ruling in *KSR Int'l v. Teleflex, Inc.*.

12

Furthermore, Applicant notes that even if the Patent Office is able to articulate and support a suggestion to combine the references, it is impermissible to pick and choose elements from the prior art while using the application as a template—see *In re Fine*, 837 F.3d 1071 (Fed. Cir. 1988). Based on the fact that Avidor et al. is not even related to base station selection, and the fact that the priority lists described in Avidor et al. are merely uplink and downlink channel group priority lists used at a base station for channel assignment, it appears that the Examiner has merely cobbled together unrelated and non-analogous features from several disparate references in an attempt to arrive at claim 1 while using the present application as a template. This attempt is flawed because the Examiner's proposed modifications do not account for the fact that the cited references fail to teach Applicant's claimed storing of uplink and downlink candidate sets, which of course means that they also fail to teach or even suggest selecting at least one base station from either the uplink candidate base station set or the downlink candidate base station set based on the predominant direction of traffic with respect to the terminal.

The numerous modifications to Avidor et al., Shakhgildian et al. and Lyer et al. that would be necessary to arrive at the claimed invention cannot be regarded as obvious because the gap between the prior art and the claimed invention is too great. Applicant notes that the aforementioned examination guideline that issued on October 10, 2007 indicates that "the gap between the prior art and the claimed invention may not be 'so great' as to render the claim non-obvious to one reasonably skilled in the art." Therefore, the proposed combination of Avidor et al., Shakhgildian et al. and Lyer et al. cannot render the claimed invention obvious.

In view of the foregoing, Applicant respectfully submits that the rejection of independent claim 1 under 35 U.S.C. § 103(a) should be reconsidered and withdrawn. For at least the reasons provided above, the Examiner's rejection of independent claim 9 under 35 U.S.C. § 103(a) should also be reconsidered and withdrawn.

By virtue of at least their dependence from one of the independent claims, Applicant further submits that the rejection of dependent claims 6, 8 and 14 under 35 U.S.C. § 103(a) should also be reconsidered and withdrawn.

Allowable Subject Matter

Applicant thanks the Examiner for acknowledging the novelty and inventiveness of dependent claims 2-5, 7, 10-13 and 15 in paragraph 5 of the Office Action.
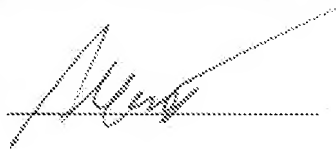
Conclusion

In view of the foregoing, early favorable consideration of this application is earnestly solicited.

Respectfully submitted,

BASSAM HASHEM, ET AL

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